

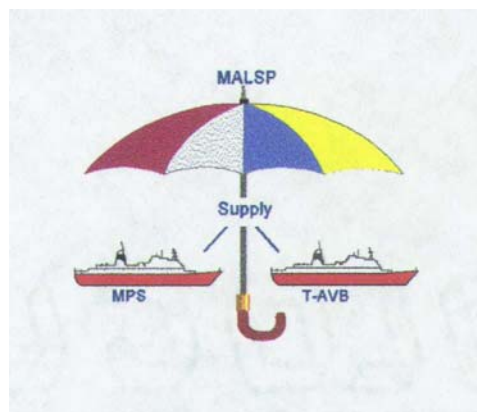
Sustainment of the Aviation Combat Element

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Sustainment
of the
Aviation Combat Element

"A Look Beneath the Umbrella"



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The Aviation Combat Element (ACE) of the Marine Air-Ground Task Force (MAGTF) is highly dependent upon the accompanying aviation logistics for its initial warfighting capability and long-term sustainment. The cost of that capability and sustainment, and the ability to rapidly mobilize it, has become one of the greatest challenges that Marine Expeditionary Force (MEF) commanders face today. The lethality and endurance of the MEF depends on a well contrived logistics operation. To echo the words of Henry E. Eccles in FMFRP 12-14:

"First and foremost is the fundamental relationship whereby the scope and timing of strategic plans are both governed by logistics capabilities." 1

An exhaustive operational schedule has accelerated aircraft systems degradation, while consuming aviation spares inventories to the point that it has compromised the Marine Corps' ability to field adequate warfighting assets. This document will describe how the management of aviation spares has not been conducive in providing surplus support material necessary for surges in tempo as it transitions from peacetime to contingency operations. Additionally, the cost and diminished availability of strategic airlift has hampered the expediency with which aviation logistics support can be established in any one theater of operations.

1 Henry E. Eccles, Logistics in the National Defense, FMFRP 12-14 (Harrisburg: 1959), P 33.

Aircraft systems support has become so cumbersome and complex that mobilization utilizing strategic airlift is not easily conducted. During the Gulf War, both airlift and sealift were greatly augmented by coalition nation assets. Over 250 missions were devoted to replenishment of equipment, materials, and supplies.² Operational plans have dictated the need to task organize aviation support so that the logistics necessary to maintain each type-model-series (TMS) aircraft arrives in theater simultaneously. Load plans and limitations make such a requirement less attainable using heavy airlift.

The Challenge

The Maritime Prepositioning Force (MPF) and Marine Aviation Logistics Support Program (MALSP) provide a source of essential aviation support assets that are staged, maintained, and preserved to meet specific mobilization requirements that are a product of operational plans. These programs serve two vital purposes in the event of global conflict. First, the aviation component of the MPF program dramatically reduces the strategic airlift footprint by providing forward deployed (afloat)

² United States, Government Printing Office, Conduct of the Persian Gulf War: Final Report to Congress (Washington, Apr 1992), P 637.

maintenance support equipment and petroleum, oil, and lubricants (POLs). Second, the MALSP functions as the War Reserve Material Stock (WRMS) management tool, permits the securing and bonding of munitions, weapons, and the full range and depth of critical support equipment and supply support assets. This ensures support deployed to any global region sufficiently enhances the full mission capability of each Type-Model-Series (TMS) aircraft.

The capabilities provided by each program are quite distinct, yet, not without duplications in effort and shortcomings. The MPF and MALSP each provision for similar high-consumption and munitions support assets. Although this is done to minimize the marshalling of high consumption items, it still represents a redundant and costly effort. Limitations of each program are reduced proportionately to the range and depth of assets that are provisioned for in each support package. This, to date, represents the most significant shortfall, as needed aviation support assets must be augmented from other available sources (garrison operational units, Navy, and industry accounts). Aviation logisticians must bring each support program under a single umbrella that permits standardization and unity of effort for maintenance, supply, and mobilization managers.

Fleet equipment managers at all levels have not given due attention to the MPF Program and the MALSP. Equipment reviews are currently being conducted every two to three years, while acquisition of support assets for each program is conducted annually. Account updates due from fleet users (squadrons) are not done with accuracy, and rarely meet expected completion dates. Appeals through the chain of command, via logistics meeting agenda and continuous correspondence, for more timely response have been entirely fruitless.

Developed to expand the benefits of amphibious mobilization, these programs have not been fully exercised. Lack of command emphasis has caused a great deal of apprehension to accept MPF and the MALSP as the solution to the ACE's rapid strike response and logistical sustainment. This lack of confidence has been counter to the purposes for which these programs were instituted - reduce dependencies on strategic airlift and enhance rapid response.

War reserve material can no longer be managed outside the guidelines of the MALSP. Supply support is the backbone of the MALSP and represents survivability throughout each contingency phase. Efforts to identify aviation consolidated allowances and construct contingency packages occur under the guidelines of the WRMS program. At the same time, apportionments from this same

stock strive to meet the supply needs of the repair site under the MALSP. Duplication in efforts to organize supply support to the ACE, along with the use of war reserve stocks for garrison purposes, has left serious gaps in the range and depth of replenishment capabilities.

The objective of this analysis is to gain an understanding of each logistic program's role in sustaining the MAGTF ACE. Equal attention will be given to proven program concepts and those lessons learned that indicate capability deterioration. The recommendation will provide recommendations for consolidations and changes to the MPF, MALSP, and WRMS programs.

Maritime Prepositioning Force (Aviation Component)

The MPF program provides the National Command Authority (NCA) and Combatant Commanders (CINCs) with strategic deployment options for mobilization of organizational level (squadron-owned) equipment resources. Employment concepts for the MPF, like those of amphibious forces, represent an economical, flexible deployment option to CINCs for

mobilizing Marine Corps forces.³ As requirements and capabilities change, the methods by which aviation support assets are employed and infused into the program are adapted.

Employment concepts for MPF are developed by the Fleet Marine Forces (FMF) in coordination with the Fleet CINCs.⁴ The primary objectives of the MAGTF Commander with regard to his ACE is to ensure that operational needs are met, sustainment is consistent with those operational needs, a rapid deployment response, and optimizing the use of limited strategic airlift.

With the enormous growth in sophistication of air combat capability and the corresponding proliferation of necessary aviation support equipment, strategic airlift has become easily consumed in movement of any portion of the ACE. Airborne and support systems have grown so in complexity that the ACE is unable to quickly establish capability without enhancements in strategic lift.⁵ Although strategic airlift has the ability to

³ U. S. Marine Corps, Maritime Prepositioning Force Planning and Policy Manual, MCO P3000.17 (Washington, DC: Headquarters U.S. Marine Corps, 14 May 1992), MCO P3000.17/POR, P 3-3.

⁴ MPF Planning and Policy Manual, MCO P3000.17. P 3-3,3-4.

⁵ Naval Air Systems Command (NAVAIRSYCOM), Support Equipment Resource Management Information System (SERMIS), aircraft systems extracts for Nov 1994-May 1996, authorized allowancing data.

rapidly mobilize combat and support personnel and emergency supplies, it is incapable of expeditiously transporting the array of advanced support systems that represent aviation combat capability and its ultimate sustainment. Maritime capabilities provided by MPF and MALSP (T-AVB ships) represent the only current solution to remedy strategic airlift shortfalls for movement planners and aviation logisticians.

The Commandant of the Marine Corps (CMC) and the Chief of Naval Operations (CNO) recognized the need to rapidly task organize MAGTF assets if the Marine Corps was to remain the service of choice for first intervention. Although the idea of expanding maritime capabilities for prepositioning logistics was born in the mid to late 1960s, action was not taken until the late 1970s because of the Vietnam War.⁶

History Propels Us

Lessons learned from the Vietnam War drove the need to develop a more efficient and cost effective means of mobilizing men and machinery. The multiplicity of tasks even for that time required that Logistical Support Areas (LSAs) be predicated on amphibious logistics doctrine. This was to ensure LSAs were

⁶ LtCol David B. Brown, USMC (Ret), MPS: An Evolving Entity, Marine Corps Gazette, 68 January (1985), P 34-39.

opened and closed as required to support operations. As Admiral Arleigh A. Burke put it:

"No matter who carries the load in any fight-soldiers, sailors, airmen or marines-they need to be supported and supplied from the sea."⁷

Although Force Logistics Support Units stood up well, the full range and benefits of amphibious resupply operations were scarcely exercised. Marine helicopters devoted countless sorties conducting resupply missions, which detracted from their ability to perform primary tasks, that of assault support. This, coupled with far too limited aviation maintenance repair services created a capability shortfall that called for bold and immediate actions.⁸

During the 1960s, Marine Corps aviation was so interested in airframe types and flying them, that little concern was given to maintenance, especially maintenance planning and procurement of aviation ground support equipment. The Marine Corps quickly realized that maintenance would be its biggest problem. By 1966, its back was against the wall of capability. To the greatest extent possible, periodic maintenance and modifications beyond

⁷ Admiral Arleigh Burke, USN.

⁸ U.S. Marine Corps, The Marines in Vietnam, 1954-1973: An Anthology and Annotated Bibliography (Washington, DC: Headquarters, U.S. Marine Corps, History and Museums Division, GPO, 1983), P 205.

the capabilities of aviation units in South Vietnam were accomplished in the Western Pacific, using naval aviation or contract services in the Philippines, Okinawa, or Japan. An example of this was the program that the Naval Air Systems Command established at Atsugi, Japan that entailed modifications to CH-46 tail rotors. The ability to sustain such programs and to conduct repair and resupply from such a distance was largely dependent on strategic lift.⁹

The Marine Corps extended the use of resupply shipping practices. Landing Ship Docks (LSD) were used extensively, using well deck areas for material storage. Containership operations were started in August of 1967 incorporating and testing Roll-On Roll-Off (RORO) concepts. Containerization of supplies permitted security and ease in mobilization aboard wheeled-frames.¹⁰ RORO allowed a vehicle to be embarked and disembarked under its own power. Transportation costs were kept at minimum only when amphibious shipping was exercised over airlift as the conduit to South Vietnam.

Expanded amphibious logistical operations began with CNO and CMC jointly developing methodology, command relationships, and

⁹ The Marines in Vietnam, P 207-217.

¹⁰ Marines in Vietnam, P 249.

cooperative tasks under Rapid Deployment Force (RDF) concepts. At the time, all three Marine Amphibious Forces (MAFs) were assigned as RDFs. Eventually only one would be assigned for contingency planning purposes. The Maritime Prepositioning (MPS) Ships program was approved in 1979, growing from a fleet of 6 ships known then as the Near Term Prepositioning Force (NTPF).

Throughout the MPF growth period the Navy recognized and supported the MPS cause. Nonetheless, scarce resources and budgetary constraints slowed the growth of MPF. One of the largest tasks was the process of defending the attainment of supplies and aviation ground support equipment where competition for resources also existed. For example, aviation supply bit-piece spares alone for the three MPS brigades was projected to cost \$1.2 billion. Funding obstacles delayed ship-funding and Navy appropriations for spares and equipment. The Marine Corps and Navy's ingenuity and determination permitted program survival and resulted in Joint USN/USMC Concept of Operations for Marine Prepositioning in a Memorandum of Agreement (MOA). The MOA signified the mutual support for MPS.¹¹

11 LtCol Brown, Marine Corps Gazette (Jan 1985), P 34-39.

MPF operations first mobilized with limited capability in 1985 and 1986.¹² The MPF program is comprised of three MPS Squadrons (MPSRON) totaling 13 ships each capable of disembarking equipment either in-stream or in port. Each MPSRON has specific forward global responsibilities that further enhance their mobilization flexibility and ability to quickly respond to most probable centers of threat.¹³ This paired well with forward presence and rapid response criteria under the National Military Strategy.

During this same period, approval was received for two aviation logistics ships (T-AVB) to assist in mobilization of Marine aviation logistics assets under MALSP, to be discussed later in this document.

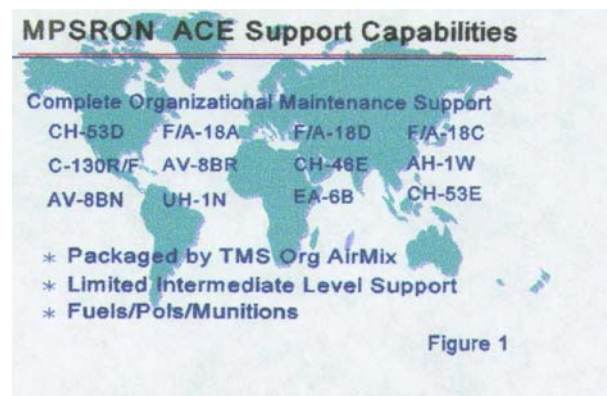
Maritime Prepositioning Ships (MPS) equipment capabilities and supplies are maintained and managed by the Commander, Marine Corps Logistics Bases' Blount Island Command (BIC) located in

¹² The first exercise involving the expanded roles of maritime prepositioning support was a two ship offload conducted during exercise Thalay Thai in 1985. MPS ships possessed only limited support capabilities not reflective of MEF needs in an other than a benign environment.

¹³ MPSRONs 1, 2, and 3 have global respective responsibilities in the eastern Atlantic, the Indian Ocean, and the Pacific regions.

Jacksonville, Florida. A thirty month rotating scheduled maintenance cycle has been establish for each MPSRON ship. This seven week maritime maintenance cycle (MMC) involves a complete offload of the ship; hull recertification; and equipment maintenance, refurbishment, and modernization. At the end of the cycle, equipment is preserved, ships are backloaded, inventoried, and redeployed.

Each of the MPSRONs are identically configured with aviation support equipment (ASE). A single enhancement ship, attached to MPSRON 2, carrying additional bulk fuels and munitions is the only configuration difference between the MPSRONs.¹⁴ ASE packages aboard each MPSRON constitutes the full complement of support needs for the organization aircraft squadron that they are configured to. Figure 1 depicts the mix of aircraft supported by each MPSRON. In addition to



organizational support needs, are those items that have been deemed necessary, and organized as such to support the day-to-day aircraft wartime operations. This additive support includes

¹⁴ Additional enhancement ships have been approved and will standardize configurations for each of the MPSRONs.

general support services normally performed by the next higher level of maintenance (intermediate level), and is provided to sustain these services until such time that the intermediate level of maintenance (IMA) is mobilized and arrives in theater.

Although aviation equipment accounts are managed at BIC, the ASE controlling authority resides at the Naval Air Systems Command (NAVAIRSYSCOM) in Washington, DC. Guided by Operational Plans (OPLANS) and Weapons Systems Planning Documents (WSPDs) for each aircraft, account planning and configuration is closely coordinated between CMC and NAVAIRSYSCOM. New and replenishment assets for MPS accounts are prioritized and maintained in the Support Equipment Resource Management Information System (SERMIS). This automated information system (AIS) is the single source for annual aviation acquisition priorities for the Navy and the Marine Corps. MPF ASE is prioritized and procured under the same Aircraft Procurement, Navy (APN) budget dollars as all Fleet aviation activities. New and replenishment assets are delivered to equipment staging areas assigned for each MPSRON ship. These assets are then assigned to a deficit account and loaded during MMCs.

MPS equipment accounts are dynamic in nature, with updates occurring bimonthly. SERMIS produces supplements to each aircraft

account that are distributed and reviewed at the unit level, at BIC, and CMC and NAVAIRSYSCOM. These supplements reflect recent changes to activity equipment accounts, including new SE, changes in authorized allowances, or new applications.¹⁵ The Fleet unit's (applicable aircraft squadron) role is to assess cognizant aircraft inventories and ensure updates and changes reflect the support needs of their TMS aircraft. Concurrence or change recommendations are passed to MPS program managers at NAVAIRSYSCOM who formalize revisions to accounts aboard MPSRON ships. If squadrons fail to review supplemental information in a timely manner, accounts reflect erroneous allowances. Acquisition decisions are based on each activity's account and the deficits that are reflected in them. Theoretically, account information should be no older than two months old in the event of activation.

MPSRONs are activated by the CINC through the Chairman, Joint Chiefs of Staff (CJCS) upon approval by the NCA to commit forces. Upon issuance of warning and execution orders, assignment of the MPSRON ships is based primarily on the geographic region of interest. A number of ACE forces to be committed will be

¹⁵ Naval Air Systems Command, Aircraft Maintenance Material Readiness Lists (AMMRL) Program Instruction, NAVAIRINST 13650.2C, Handling of bimonthly supplemental data (Arlington, VA: 16 Jan 1992), P 7.

assigned and directed to draw MPF assets upon arrival in theater. ACE squadrons will be provided ships inventory files created during MMC backload. These files represent the MPSRON's full complement of repair and servicing capability for that squadron. Upon complete review of inventory files, any deficits that are evident deploy with the designated squadron during the fly-in-echelon (FIE).¹⁶ Once in the amphibious operation area (AOA), designated units draw their accounts inventory and transport by other means to forward sites. Supply pickups round out capability for the first 30 days or until such time that the IMA can be mobilized.

Marine Aviation Logistics Support Program

The MALSP represents the means by which the ACE commander mobilizes the IMA and supply support that extends Marine aviation capabilities beyond the initial phases of combat. As lines of communication and replenishment are established, the Marine Aviation Logistics Squadron (MAL S) providing IMA support under the MALSP is capable of continuing sustainment indefinitely.

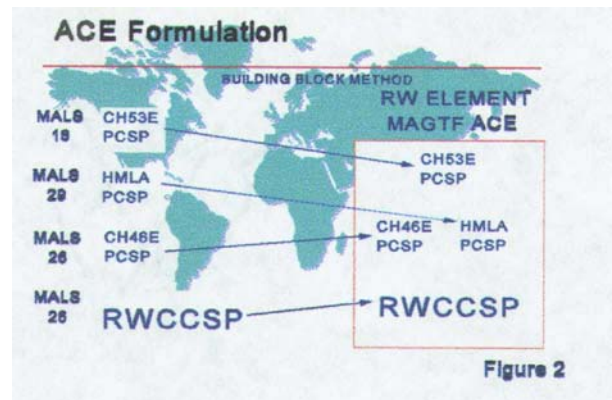
¹⁶ Deficits in MPS accounts occur only as a result of inventory turnover and acquisition decisions that determine a certain allowance will remain deficit due to an end items high cost.

The Marine Aviation Logistics Support Concept (MALSC) was developed in 1987 to task organize the four pillars of IMA sustainment: people, supply parts, support equipment, and mobile facilities. Each element would be organized and aligned to OPLANS, WSPDs, Aviation Consolidated Allowance Lists (AVCALs), and the Table of Basic Allowances (TBAs). The range and depth of each support package is consistent with the support needs for the notional mix of aircraft of the MAGTF ACE.¹⁷

As program implementation was carried out MALSC was renamed MALSP and each Marine fixed and rotary wing MALS were apportioned with fly in support packages (FISPs) and identically configured contingency support packages (CSPs) for the TMS aircraft assigned. Mirror-image configurations permitted the marriage of CSPs from a combination of MALS without losing support integrity. Figure 2 depicts how CSPs can be brought together from any MALS

¹⁷ The aircraft notional mix is provided to NAVAIRSYSCOM by CMC,(DCS(Air)), through Aviation Plans and Program (APP). Based on a given quantity of aircraft for each TMS in that mix, support allowances are signed based on utilization and consumption figures for each supported system.

as build up of the ACE for either the fixed or rotary wing is carried out.¹⁸ The key to ACE sustainment is the flexibility built into the MALSP. CSPs of repair capability and spare parts can be rapidly configured to support the contingency aircraft mix and are easily marshaled for follow-on movement.



CSP accounts comprise the necessary support assets (equipment sets and supplies) to establish long-term repair and sustainment capability in theater. Equipment account management and updates are handled in the same way MPS accounts are. Revisions come by way of bimonthly supplements that are reviewed at the MALB to ensure allowancing remains germane to support requirements of

¹⁸ Contingency Support Packages are either Peculiar or Common. Peculiar Contingency Support Packages (PCSPs) comprise those support assets that have application to a single aircraft type/model. Common Contingency Support Packages (CCSPs) support two or more type/model aircraft. Ex: Inertial Navigation Systems are the same on the F/A-18, AV-8B, & EA-6B aircraft. Therefore, the same test station supports all three from the CCSP. Conversely, Radar systems are different among those 3 aircraft models, and thus have their own separate stations arranged in independent PCSPs.

each fixed and rotary wing CSP.¹⁹ Inventory tracking and accounting procedures are much more tedious at the MALS level, as the IMA involves greater volumes of equipment sets that are organized in numerous CSP configurations.

FISP and CSP capabilities are housed in durable mobile facilities (MFs), which are small, mobile, work centers and storage units that are easily assembled and arranged to provide limited IMA support to the ACE.²⁰ Powered by mobile electric power plants, MFs can be arranged to support all or any subset of the ACE.

FISPs support the fly in echelon (FIE) during the initial movement phase of operations, providing bit-piece part assets for thirty days. Aviation fly in support was originally provisioned for under the WRMS program, where assets are bonded and protected for wartime use only. As supply support under the MALSP was organized, the WRMS program could no longer function

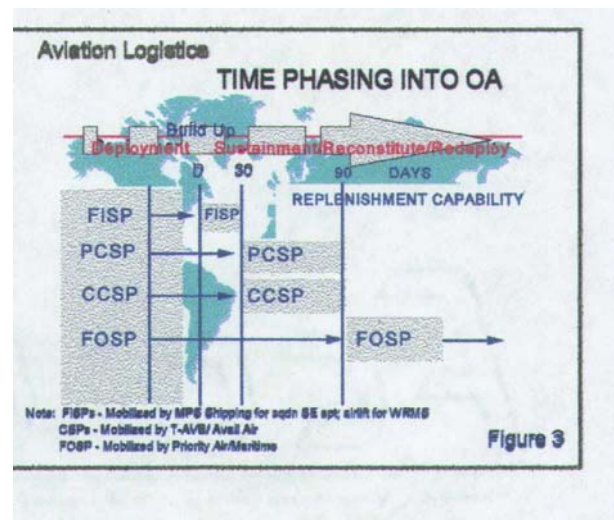
19 U.S. Marine Corps, Marine Aviation Logistics Support Program (MALSP) Programming Planning Document (PPD) (Washington, DC: Headquarters, U.S. Marine Corps, Oct. 1994, P 3-5.

20 MALSP support has always been considered limited since hardsite mounting of certain repair capabilities (i.e., complete engine repair, major structural remanufacture, and a few bulky avionics stations) were not considered deployable. Those capabilities were supported through spares supplements via deployable pickups.

independently.²¹ The MALSP provided the most accurate means of matching repair and support needs to the array of established MAGTF aircraft mixes.

War Reserve Material Stocks

Not only fly in support, but long-term preparedness of aviation weapons systems is dependent upon the ability to measure needs and adequately reconstitute degraded airborne and repair site components under escalated wartime conditions. Successful in depth sustainment of the ACE is accomplished by SE and capabilities requirements arranged under MPS and the MALSP. Organization of supply support to those capabilities is guided by requirements of the WRMS program. As depicted in Figure 3, these three programs task organize aviation support to fit and overlap during each phase of aviation capability development.



²¹ U.S. Marine Corps, War Reserve Material Policy (draft), MCO P4400.39G (Washington, DC: Headquarters, U.S. Marine Corps, 1996), LPP-2, P 1-10.

Policy and guidance under the WRMS program require that aviation stocks must be acquired in peacetime sufficient to attain operational objective for scenarios and other stock objectives approved for programming in the Secretary of Defense Planning Guidance (DPG).²² In other words, it is recognized that peacetime material requirements are insufficient to meet the increased consumption that war demands. Therefore, those additive requirements should be identified and procured during peacetime.

Although a stand alone program, the WRMS assets are an integral element of the MALSP. Organized by TMS aircraft and repair systems support, the WRMS assets accompany SE CSPs during a contingency to ensure that adequate levels of bit-piece support is consistent with notional repair capabilities.

The only significant difference between SE and supply support under the MALSP is sourcing. SE assets are not near-term perishable items and therefore are not replaced with any great frequency. For example, a mobile electric cart has a service life that exceeds fifteen years. SE CSPs are sourced from everyday-use equipment at the squadron and the intermediate level

²² MCO P4400.39G, War Material Reserve Policy, P 1-2.

activities. Allowances in peacetime are computed at combat operations levels. There are no separate war materials budgeting or acquisition process needs, as units are allowanced and provisioned for at wartime levels continuously.

Aviation supply assets are consumable, highly perishable items. Inventory turnover occurs on a daily basis and is so high that maintaining war reserves at combat levels perpetually becomes economically prohibitive. To permit the build up of WRMS, lower levels of aircraft readiness is accepted during peacetime. The bottom line here is that SE packages are constructed from existing activities inventories that experience only changes in inventory material condition and almost no changes in equipment on hand availability. Supply asset CSPs, on the other hand, are unstable and built from inventory in the system at a single point in time. Over a matter of days, wild swings in inventory and material accounts are not uncommon.

Aviation war materials are allowanced and organized in a similar fashion to SE CSPs. Usage data, flight hours (wartime), and aircraft mix are variables that go into allowance computations. WRMS AVCAL levels are based on 90 days of combat operations. These operations are characterized by a surge in flight hours, when compared to peacetime, that

represent an additional strain on repair site and supply account resources.

The single agency for account allowancing and provisioning is the Navy Inventory Control Point (NAVICP) located in Philadelphia.²³ NAVICP conducts constant review to ensure that materials are budgeted for and provisioned for combat conditions. Differences between combat and peacetime supply requirements are registered and specifically defined as war reserve material requirements. They are organized as CSPs under the MALSP, shelved and made available alongside peacetime allowances. Program funds are budgeted to fill WRMS shortfalls.²⁴

Supply support earmarked for WRMS purposes are guarded assets that are maintained at the wholesale level. Although protected, these assets can be obtained for priority peacetime operations, with the intent of immediate replenishment. Rotating material stock is a common practice where inventories are abundant, but

²³ The Aviation Supply Office (ASO) was renamed NAVICP in 1995 as a result of expanded roles and increased joint services supply functions.

²⁴ Major Terry Reid, Aviation Supply Officer (6602), Command and Staff College (97), views on War Reserve Material Stocks, interview by author, 7 Jan 1997.

infrequent access, if left uncontained, noticeably depletes WRMS accounts integrity and eventually leads to degradation in sustainment to the ACE. Supply inventory shortfalls will be discussed later, by describing how WRMS was put to the test in Desert Shield and Desert Storm.

During activation and mobilization, initial WRMS CSP requirements are filled with host station allowances (i.e., Marine Air Group and Air Station Supply). The WRMS satisfies the bulk of the remaining CSP allowances.²⁵ Supply support CSPs are then organized, named, and mobilized in the same manner and along with the remaining three pillars under the MALSP (personnel, support equipment, and mobile facilities).

Within the first 30 days of call up, fixed and rotary wing CSPs begin to mount out aboard aviation logistics support ships (T-AVB). With the approval of the build up of MPS maritime capabilities in the late 1970s, acquisition of two aviation logistics T-AVB ships was approved with the primary mission of providing dedicated sealift for the movement of the IMA to support rapid deployment of fixed and rotary wing aircraft units.

²⁵ Ibid.

T-AVB aviation logistics container ships, provide distinct advantages over strategic airlift. A single T-AVB is capable of transporting the equivalent of 140 C-141 sorties.²⁶ This itself clearly relieves the heavy drain on the orderly build up of forces when airlift is the sole means of mobilization. T-AVB lift maintains integrity of CSPs underway by movement of up to 680 MFs (non-functional) in a single movement, permitting quick assemblage in the AOA. T-AVBs, with onboard MF complex power and an approved helicopter landing deck, are capable of providing limited IMA services underway prior to arrival in the AOA.²⁷ The arrival of T-AVB and CSPs in theater begin the sustainment phase of ACE operations. Long-term operations (90 days and beyond) of both the OMA and the IMA are further supported by established lines of communications, logistics channels, and follow-on support packages (FOSPs).

The Real Test - Desert Shield & Desert Storm

The MPF and T-AVB went from a paper to a proven concept during the Persian Gulf War. Desert Shield was the modern day maritime

²⁶ LtCol Henderson, David G. USMC (ret), T-AVB Ships: Vital Ingredients for MAGTF Sustainment. Marine Corps Gazette (Jan 1993), P 17-19.

²⁷ If it's determined that MFs must be functional underway, T-AVB MF capacity is limited to 300. This is due to the need for configuration and access requirements when under power.

acid test for MPS and MALSP programs. FISPs accompanied aircraft ferry flights that would join on designated MPSRON ships aviation SE inventory to establish initial support. Only eight days after activation on 7 August 1990, the first ships from MPSRON-2 arrived at the port of Al- Jubayl, Saudi Arabia. Offload of support from MPSRON-2 for the 7th Marine Expeditionary Brigade (MEB) was completed without incident. On 26 August, MPSRON-3 arrived in support of 1st MEB forces. At the request of the U.S. Central Command, the Wright (T-AVB 3) and Curtis (T-AVB 4) were directed to respective ports for embarkation of the IMA's MFs, supply and maintenance CSPs, and cargo containers in support of the ACE.²⁸ The Curtis arrived at Manama, Bahrain on 25 September where it offloaded fixed wing equipment and supplies. It proceeded to Al-Jubayl and functioned as the afloat rotary wing logistics support complex. The Wright, once in the Persian Gulf, provided fixed wing IMA support to 3rd MAW at Bahrain. Once ashore organizational and intermediate level aviation assets were transported overland to fixed and rotary wing ACE locations throughout Saudi Arabia.²⁹

²⁸ LtCol Henderson, David G., P 17-19.

²⁹ U.S. Marine Corps, U.S. Marines in the Persian Gulf, 1990-1991: Anthology and Annotated Bibliography (Washington, DC: Headquarters, U.S. Marine Corps, History and Museums Division, GPO, 1992), P 8.

Among the numerous successes that Desert Storm produced is that MPF and MALSP utilizing T-AVB are the only efficient way to reduced buildup time and allow for a smaller, more widely dispersed footprint, while maintaining acceptable levels of combat ready aircraft. The achievements in the Gulf, will not provide the answers to future problems; they simply point to the number of valuable lessons learned that represented capability deficiencies which leave room for meaningful improvement. The lack of confidence in the MPF program; MPF equipment accounts being managed separate of the MALSP; and the redundant efforts to organize and manage supply accounts under the MALSP and the WRMS program, are the most glaring aviation logistics deficiencies.

Aviation ground officers at Aviation Logistics Departments (ALDs) at Commander, Marine Forces (COMMARFORs) and Marine Air Wings (MAWs) had little confidence in the support capabilities of the MPF. Having never been fully tested, and with ships inventories held close to the chest, this "Paper Tiger" gave little reason to leave garrison-owned assets behind as squadrons mobilized to the battlefield. This contributed significantly to offload and retrograde deficiencies. First, a number of squadrons deployed to the Gulf with support assets despite being tasked with drawing MPS assets at Al-Jubayl upon

arrival. Second, a few squadrons that had not been previously directed, drew SE to supplement and surplus their accounts.

These actions burdened the Timed-Phased Force and Deployment Data (TPFDD) planning process and prevented an accurate assessment of strategic air lift requirements for later arriving units. Airlift requirements were often underestimated where squadrons deployed with SE in excess to their needs. The phasing of support capabilities became piece-meal as available airlift could not meet demand.

Ignoring established MPS guidance became most evident upon completion of the build up phases and during redeployment. As MPS offload was completed, a capability deficit had developed, some squadrons had inventory excesses while others had SE gaps. This was later resolved by asset sharing by collocating units and through equipment redistribution to balance accounts.

Despite efforts to balance unit inventories, accountability of equipment drawn from MPSRONs was all but nonexistent. Inventory tracking and replenishment became unmanageable during reconstitution. During the retrograde approximately \$4 million of ASE inventory was missing from ships accounts. This figure was confirmed as offload was completed at BIC. A call for world-wide inventories of Navy/Marine Corps garrison accounts was modestly fruitful. A mere \$250 thousand in equipment was

recovered from the few units that responded and reported excess inventories.³⁰ Accounts would eventually be reconstituted in late 1995 through new procurements from limited APN budgets and through Type Commanders redistributions from existing accounts.

This demonstrated lack of confidence in the capabilities of MPF was most likely brought on during its inception in the early 1980s. As the program was being implemented, little occurred in the way of training or education. The program underwent early budgetary strain, but training could have been conducted at very little cost; none was. Aviation SE accounts were quickly developed and budgeted for by CMC and NAVAIRSYSCOM. At that time, little was occurring in doctrinal or curriculum development to educate anyone - from commanders to equipment handlers. Aviation SE accounts were established aboard ship, inventory was delivered, but few in the fleet had visibility of what capability existed under MPS concepts. Squadrons balked at the notion that their support was coming from a source that they had little

³⁰ Inventory deficit figures came from Local Assets Management Systems (LAMS) (May - Dec 1991 extract) files that account managers use to report inventory actions to SERMIS - a higher headquarters AIS that feeds TPFDD.

knowledge of. This reluctance was equally exacerbated by the manner in which MPS accounts were managed.

Account management represents a second area of capability deficiency, and gives further reason for logisticians to have misgivings towards MPS capabilities. Accounts under the MALSP are managed by the joint efforts of the TYCOM and fleet squadrons. Account updates occur as a result of fleet recommendations to the TYCOM during supplement cycles. The account's allowance and inventory posture are immediately visible to all squadrons through the use of local AIS (LAMS). Squadrons know where their deficits are and can pursue priorities long before being tasked. Their accounts remain lively and embarkation requirements are clearly and quickly understood.

MPS SE accounts are managed separate of MALSP even though there are many interdependencies. NAVAIRSYSCOM, the TYCOM, and the SE Branch at BIC collaborate in the management of MPF ships inventory. Supplements are viewed by fleet squadrons, but they have no on hand inventory information until files are delivered to the cognizant MAW after MMC occurs - every 30 months. The volume of SE that accumulates in that period is immense and changes the entire makeup of aircraft accounts. Information that

old does not reflect most recent inventory alterations, those that are of greatest interest to using squadrons.

LAMS is used to inventory the incoming and outgoing SE, the same as with the MALSP. Yet, account managers and equipment handlers at BIC are comprised largely of civilians who have limited SE experience or knowledge. They cannot immediately recognize account discrepancies, and therefore accounts tend to remain less active with respect to recommendations for revisions. Fleet TMS experts are better suited to view, understand, and bring attention to the impact of inventory deficiencies. If ship accounts could be viewed each day, squadrons would have visibility of moving inventory, make frequent change recommendations, and gain an appreciation for what capabilities MPF operations provide. Most importantly, however, units would understand with a higher degree of accuracy their strategic lift requirements.

The third capability deficiency is supply support under the MALSP and the WRMS program. Long before operations in the Persian Gulf became imminent, material accounts were being scrutinized for adequacy in range and depth of support. Authorized wartime allowance levels were matched against contingency support requirements. As staging for combat operations began, aviation supply peacetime stocks at Marine air

stations and Marine Air Groups were supplemented by additional inventory authorized as part of the WRMS program needs.

Critical supply shortages were identified and prioritized during the build up of CSPs. Deficiency priorities were based on Mission Essential Systems Matrix (MESM) degradation categories.³¹ Those airborne systems that had high demand rates, and if upon failure would render an aircraft "Not Mission Capable," were considered high priority CSP necessities.³² Assemblies that did not deteriorate the flyable status of aircraft did not receive the same attention, so priority was based entirely on historical demand for the item. Each TMS aircraft, both fixed and rotary wing, has its own unique systems degraders based on assigned mission and systems reliability. Where possible, supply deficiencies were filled by emergency buys from available commercial and defense sources. A number of critical item deficiencies were satisfied from aircraft production lines and

31 Naval Air Systems Command, Mission Essential Systems Matrix (MESM), OPNAVINST 5442.4M, (Washington, DC: Naval Aviation Supply Office, July 1992), OP-515, P 2-4.

32 Naval Aviation Maintenance Office (NAMO), Naval Aviation Maintenance Program (NAMP), OPNAVINST 4790.2F, (Patuxent River, MD: NAWCAD, June 1995), ISSO 9660, Chapter 12. There are many categories of an aircraft's readiness reporting status. Aircraft material condition status are arranged in three broad categories: Full, Partial, and Non Mission Capable Systems.

commercial repair locations.

Despite all efforts to deploy CSPs at the highest levels of support, many shortfalls existed. To satisfy those remaining urgent needs, logisticians resorted to cannibalization of non-deploying, flyable aircraft, rendering many NMC for numerous supply parts.³³ Cannibalization ranged from easily removable avionics boxes to complete engine assemblies. These same cannibalization actions were carried out by the British to offset a shortage of Challenger tank engines and gear boxes. Margaret Thatcher was willing to sacrifice readiness at home for forward fighting armored divisions.³⁴ Cannibalization continued throughout the duration of the Gulf War, as contracts could not be let quickly enough. Emergency needs were most easily met by non-participant squadron aircraft. A number of remain behind squadrons

33 Major Shaugnessy Reynolds, Aircraft Maintenance Officer (6002), Command and Staff College (97), Cannibalization of Squadron Aircraft during Desert Shield/Storm, interview by author, 9 Jan 1997.

34 Michael R. Gordon and LtGen Bernard E. Trainor, USMC (Ret). "The Generals' War." (New York: Little, Brown and Company, 1995), P 167.

experienced plummeting readiness figures as a result.³⁵ Their ability to train and provide replacement crews or aircraft were markedly diminished. Dependency on excessive cannibalization actions decreased as IMA capability was established in theater, but not before the accumulation of numerous NMC aircraft.

Accessibility to WRMS was limited to requirements that would assist in the emergent need to ferry aircraft, where replacement stocks were expected after completion of aircraft movement. The only other instance of authorized stock usage was for inventory turnover purposes, where equipment upgrade was required or consumable items were reaching shelf-life limits.

Up until the time of the Gulf War, war supply stock levels had been reduced, as access to WRMS for peacetime operational requirements became a frequent practice. Austere budgets frustrated NAVICP's ability to maintain acceptable reserves. Aviation stocks became dangerously inadequate as WRMS were treated merely as excesses to peacetime allowances,

³⁵ Aircraft Material Readiness Reports (AMRR) for remain behind squadrons during build up and the first six months of Desert Storm (Aug 1990 - Feb 1991).

not as assets vital to sustainment of the ACE engaged in contingency operations.

Conclusion

Weapons system platforms of the ACE provide the preponderance of heavy firepower to the MEF Commander. This lethal capability is vital to battlespace shaping and force protection functions. This enormous capability is only viable so long as airborne equipment sustainment can be brought to the fight quickly and carried out in a manner that least impedes assigned aircraft mission capabilities. Prior to the hostilities in the Gulf, the ability to sustain the ACE efficiently was piecemeal. Aircraft systems support was crude at best, only basic, noncomplex airborne components were adequately maintainable. The sophistication and expansion of Marine aviation during and throughout the Vietnam War had exceeded organic abilities of maintenance repair squadrons of the IMA. This immense growth in capability equated to new strategic lift requirements that prefaced an expanse in maritime lift concepts. The MPF Program and the MALSP (T-AVB mobility) were offspring of that expanse that evolved and proved to be decisive force multipliers during the Gulf War.

During the Gulf War, MPF and T-AVB ships provided the flexibility, response, and build up capabilities that were entirely absent during the war in Vietnam. Ships responded as advertised throughout each phase of the campaign, offloading SE, supply parts, and war material reserves commensurate with each level of sustainment build up. During the Gulf War, maritime concepts to mobilize the OMA and the IMA were authenticated; albeit, a number of sustainment deficiencies were validated as well.

The capabilities that the MALSP and MPF program brought to Desert Shield and Desert Storm were historic; however, extraordinary efforts were necessary to correct inventory imbalances that occurred by lack of confidence in those capabilities. Inventory mismanagement and accounting led to early capability deficiencies that are inexcusable. Squadron commanders and logisticians, both on and off the battlefield, demonstrated a notable degree of ignorance with regard to program compliance. An example of this was evident in LAMS reporting files that reflected transfer of hundreds of SE by MPF custodians, but no subsequent receipt reporting by Marine aircraft squadrons. Their reluctance to administratively accept custody of SE they took possession of only confirmed the absence of program confidence. This latent behavior can be attributed to

a number of factors, but none more gleaning than the absence of command attention, education, and training at all levels.

The Marine Corps has made some positive headway in solving its aviation support equipment management dilemma with the formalization of a primary Military Occupational Specialty (MOS), 6042, SE Asset Manager. The Marine Corps needs to carry training several steps further. Currently, the few 6042s that comprise the MOS are the only aviation Marines receiving any basic MPS and MALSP instruction at fleet schools. Deployment planners and equipment handlers require extensive training and program familiarization as well. MPF training must supplement the curriculum at the Supply Officer's and Aircraft Maintenance Officer's Schools, both at the first-term and intermediate level courses. Practical application and contingency drills should be provided in the academic environment to the fullest extent, as they are the only way to grasp the full meaning of MALSP and MPF capabilities. The Naval Aviation Maintenance Training Group (NAMTRAGRU), working together with CMC (ASL), must determine if those aviation service schools provide the needed knowledge and skills to aviation logisticians to be effective MEF planners and material custodians.

In reality, the MALSP and MPF programs need to be resold to their aviation component as enhancement ships are procured and if greater success is expected in future contingencies. Program sponsorship at CMC under DCS(Air) must come together and develop not only the training associated with these programs, but meaningful metrics. Henry Eccles stated it most clearly that:

"The potentially bad effects of the momentum of logistics can be overcome by appropriate command control at the various levels of command."³⁶

CMC(ASL) must develop scheduled inventory reporting criteria for Organizational and Intermediate level squadrons. Reporting can be carried out with such frequency that it serves not only to identify deficiencies and excesses, but to guide TYCOMs and NAVAIR in the formulation of acquisition objectives. Inventory accuracy and preparedness can be evaluated and measured against established goals, and can be most useful in development of a believable strategic lift footprint.

Another valuable means of measuring (metrics) a squadron's preparedness is through the use of MCCRES, Aviation Logistics Maintenance Team (ALMAT), and TYCOM inspection teams. To date,

³⁶ Henry E. Eccles, FMFRP 12-14, P 130.

these processes only scratch the surface of what's required to truly evaluate the equipment readiness of a unit. Inspection evaluations must go beyond material condition and include inventory reporting accuracy, up line deficiency reporting, material trends, and equipment tailoring recommendations. Expanding evaluation criteria will serve to direct the attention of commanders and equipment managers to the meaningful details of SE management, and will create a competitive environment from which aviation logistics can flourish. When squadrons compete for material readiness, as they do today, that readiness will include not only aircraft, but support equipment as well.

Both MPF and the MALSP must remain constant themes and given due consideration throughout the syllabi of all aviation logistics academia and professional military education, while being a perpetual agenda topic for logistics officers symposiums and reviews. These two programs are the centerpiece for the management of each pillar vital to ACE capability sustainment.

Movement during the FIE and core build up are often complicated by the experience levels of our Sailors and Marines. Plans, operating procedures, and continual training will fill experience voids and ensure that all personnel

understand the potential of MPF and the MALSP contingency operations.³⁷

Organizational squadrons can not rely on a time consuming chain of custody to retrieve vital ships inventories. Account data must be instantly available to permit squadrons to view inventory activity. Query access to SERMIS must be resident at all levels where aviation logistics decisions are made. SERMIS is accessible through any open computer systems architecture and is easily routed to personnel computers at the squadron via local servers (mainframe or node). If tactical level units are charged with providing recommendations to MPS accounts, they must be aware of ships accounts transactions. Whether it be new additions, deletions, applications, or allowancing updates, organizational and intermediate level squadrons must have complete visibility of support package configurations. This visibility facilitates an accurate assessment of deficits, change requirements, but most importantly, a constant update of strategic lift needs and TPFDD sources.

There is no immediate, apparent solution to capability deficiencies of the WRMS program. Budget limitations and

³⁷ LtCol David B. Brown, USMC (Ret), MPS: How Goes It? Marine Corps Gazette, 72 (January 1988), 31-33.

operational peacetime demands will continue to strain availability of supply support stocks. Cannibalization of A10 aircraft has been a common and accepted practice, not just for war contingencies, but for training exercises as well.³⁸ Aircraft needs are immediate, replenishment and supply support contracts are not; therefore, the only source of replacements, when supply shelves are empty, are aircraft production lines and squadron flight lines. What does seem apparent, is if increased levels of war stocks are to be maintained in peacetime, under the MALSP allowancing and packaging scheme, and if access to increased levels is not exclusive to war contingency, then the WRMS program can be eliminated for management of aviation stocks. The WRMS program provides no protective blanket for consumption, it defers to the MALSP for AVCAL allowancing calculations, and remains as nothing more than an administrative nuisance for supply officers' considerations.

So long as the Marine Corps' involvement in multiple contingencies remains possible, aviation logisticians must review the frequent practice of aircraft cannibalization to fill supply shortfalls. The capability to deploy to a second conflict is diminished proportionately to the pillaging of sister-command aircraft. This problem is further magnified as the integrity of

³⁸ A10 is a code assigned by OPNAVINST 4790.2G to any aircraft that is considered combat ready.

aircraft capabilities are effected by removal and replacement actions for purposes other than repair.

In many aviation logistics circles, the MALSP is advertised as an umbrella concept, that includes MPF, T-AVB, and an elaborate CSP allowancing system for IMA supply and maintenance support. In theory, the MALSP could be an all encompassing program, although it has not been exercised as such. Organizational capabilities aboard MPF ships are managed separately and are not subordinate to the MALSP. Currently, the MPF program and the MALSP are stand alone capabilities and can be deployed independently. The pillars under the MALSP are to provide the foundation upon which aviation logistics capabilities are developed. A stronger foundation means a more sturdy, all inclusive, credible aviation program. MPF and strategic mobilization should be considered additional pillars.

Regardless of the extent of the contingency, whether it be short in duration, where only the immediate needs of the squadron are to be satisfied, or where full mobilization of the IMA and T-AVB is prescribed, aviation logistics must be a consistent, seamless process that minimizes operational pauses for the MEF commander. The MALSP, as the umbrella approach, will underpin

the practices under each support element and allow aviation logisticians to seek a single source for the answers regarding support of the MAGTF ACE.

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